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AUTHOR Crowther, Warren
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ABSTRACT

This article addresses the conditions of developing countries which must be taken into account in developing information strategies for their public and educational institutions or projects. Its central argument is that newer information science concepts, although they demand technological and conceptual sophistication, can be useful in the transition from an information-poor society toward information richness; however, they have to compete in practice with a continuing flood of modern and less demanding concepts which lead towards the traps of a poor-information society, or a society with information, but without the power or decision-making effectiveness that should go with it. To demonstrate this point, 24 design principles for information strategies obtained directly from recent experience in the public sector and universities in 20 Latin American countries are enumerated. These principles are proposed as specifications for technical cooperation with Third World countries in general. Additional information is provided in 11 endnotes. (KM)

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Tailoring information strategies for developing countries : some Latin American experiences

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by Warren Crowther*

This article addresses the conditions of developing countries which must be taken into account in developing information strategies for their public and educational institutions or projects. Its central argument is that newer information science concepts, ever more demanding of technological and conceptual sophistication, can ironically be useful in the transition from an information-poor society towards information richness, but that they have to compete in practice with a continuing flood of modern and less demanding concepts which lead towards the traps of a poor-information society or a society with information but without the power or decision-making effectiveness that should go with it.

To demonstrate this point, mention will be made here of twenty-four design principles for information strategies, obtained directly from recent experiences in the public sector and universities in twenty Latin American countries. These principles are taken into account in the methodology elaborated by the Central American Institute of Public Administration for the countries of its region and are proposed here as specifications for technical cooperation with Third World countries in general (1). The principles, and Latin American examples of their application in strategy design or implementation, are as follows:

1. The starting point of information strategy is an evaluation of the quality and utility of the products of the client institution, project or sector (2). One cannot presume that this is already known or taken into account by the client. Example: A diagnosis of the library and information support systems in the large national universities in two countries began with a rapid evaluation of the student theses, professors' research projects and course bibliographies in each of the faculties. Not only should these products demonstrate high quality in terms of their updatedness (with the exception of some subjects) and relation to the scientific developments of the field, but the university should produce a student motivated and trained to constantly update him or herself with relevant professional contextual information. The focus on these academic products led to surprising conclusions. In one university, the very faculties most advanced in the use of computers were producing the poorest quality products, apparently due to near abandonment of bibliographical services and of theory-development in their fields in favor of strictly empirical data processing. In the same university, only two of the interviewed librarians in 17 specialized libraries could name the major current thesis and research topics in their respective faculties, and none could name the courses which had the greatest problems of obso-

* Warren Crowther, a DFD member, works at the Central American Institute of Public Administration, United Nations Development Programme, San Jose, Costa Rica.

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lescence of bibliographical materials. In both universities, we discovered that most students obtain an undergraduate degree without once handling an academic journal in their field, and thus do not know these sources of professional awareness, even in faculties which count on a large number of journal offerings in the university libraries. Although all information centers were found to be very deficient in services, in general we found that the centers with some better-trained staff and a minimum of six workers (which permitted some specialization of tasks) were associated with the faculties which produced the best academic products. The majority of the centers had very little or even a negative impact on the quality of the academic products of their client faculties (3).

2. Information strategies should respond to complex organizational or project objectives, not always well understood or thought out by the organization's or project's leaders. Normally, there has to be an explicit consideration of complex factors of efficacy, including interests of the State or society which have not been delimited, and of efficiency, including the effort and costs to the client or user of the organization's products or services. Otherwise, the new information will concentrate attention on a partial or restricted aspect of the situation. Example:

   A nationalized banking system wanted a study of credit administration, with recommendations of information improvements in order to reduce the time in credit analysis and disbursements. While delay and red-tape were the concerns of the moment, we tried to demonstrate that other latent concerns, such as the evaluation of risk, the need to assure that the loans were productive for the country, the planned development of managerial and analytical capabilities in the banks and the abuses of the credit system in indirect forms would sooner or later have to be considered and balanced against the desire to speed up the credit process.

3. Information strategies must respond to situations where the major need for information precedes the moment of clarity regarding purposes. In practice, we find that information specialists too often complain that their clients "do not know what they want", instead of helping them obtain information to clarify that need. Example: We have seen that researchers in public and university institutions often undertake serious bibliographic searches once the field research is underway or nearly terminated, rather than using state-of-the-art analyses to help define research goals and scope. We propose or design decision support strategies for the entire research process, from the initial topic consideration to the final distribution of results and storage of research materials.

4. The goal is not always to reduce uncertainty, but rather at times to increase it. The commonly used management-by-objectives approaches to defining information needs presume that the clients' thinking about institutional or project goals is rather complete and mainly requires some ordering. A more beneficial approach introduces variables or considerations beyond the range of experience or conceptualization of the client. In developing countries, this means always helping the client to see the immediate problems in relation to the current political, economic, social, cultural and technological crises, no matter how small or routine the information problems may seem. All information systems help focus attention on the major crises affecting the country, or away from these crises and the application of the country's scarce resources to deal with them. Example: We have found

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that the longer-term usefulness of information systems in public enterprises, for example for decision-making on investments, pricing of services or administrative controls, requires the periodic introduction of information which upsets or challenges the going forms or formulas for arriving at these decisions. The evaluation criteria which are the bases of the decision tables need to be questioned. Introducing chaos is a virtue at times. This is done by demonstrating rather quickly and simply to the client the limitations of his or her framework of thinking and action regarding the organizational or project problems, and/or by offering alternative normative models and interpretative techniques for analyzing the situation.

5. Since information resources are in very short supply and the costs of changes are relatively high, information strategies should respond to major "payoffs" or change opportunities more than to the major information "problems" or "needs". Priority is too often given to the biggest felt information "needs" (which require a long-term investment before organizational production, efficacy or efficiency are improved markedly) or, on the contrary, to attack the less controversial problems (in those cases, for example, when the information centers want to avoid conflict areas), in either case resulting in small short-term returns. Example: In one Finance Ministry, we agreed with the directors and other consultants that the computer operation was very inefficient and "needed" a complete modernization, but warned that this would not produce sizable improvements urgently needed by the country, such as more tax income, less evasion, more control of public spending and less corruption, in less than five years. Smaller scale changes in data-handling at the sources and increased information user capabilities would bring some returns much sooner, and in any case would be necessary if the eventual computer system modernization were to be effective.

6. A systematic confrontation is needed between various sources of definitions of information problems, since the clients tend to be confused and poorly-informed for this task and the information centers (data processing centers, documentation centers, libraries, statistical units, etc.) tend to identify very little with the clients' overall information problem. Example: In a study in one country, none of the 30 interviewed managers of information centers defined the major information problems of the institutions they served in the same terms as those of the top executives of these same institutions. Nor did any of the information managers relate the work of their centers with the organizational development or policy problems of their client institutions. The information managers and institutional executives didn't even agree regarding the data handling problems. For example, there was a tendency for the computation center managers to be concerned about the unused capacity of the machines, while the top executives were concerned about the production already of large quantities of computer output which no one was using. We used the Delphi Method (4) successfully to generate a confrontation and assimilation of the diverse points of view of the information providers and users in several institutions.

7. The overall primary purpose of an information strategy is the introduction, in the most efficient and effective manner, of new knowledge and skills which improve the users' situation or reduce his problems. This purpose normally is pursued simultaneously by a number of optional means, of which information services are only one. Others which can be more effective or necessary complements are training, consultan-

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cy, technical cooperation, research and personnel recruitment. In practice, these options are rarely compared or coordinated. Rather, they implicitly compete with each other. The information strategy should consider all these options in case they can be more effective than information services or in case they are necessary complements to information services, in order that the organization or project really will be able to make use of the new knowledge and skills which are to be transferred or stimulated. Example: In the health field, we have seen the usefulness of combining training, technical cooperation and information strategies in order to enhance and sustain learning by health practitioners. Normally, we find these strategies developed separately, and the result is that the learning curve of these practitioners is very irregular, some depending on occasional consultants or courses to update them and others receiving periodic documentation.

8. A study of possible decision support should consider the alternative of not generating or delivering new information. Especially in the smaller countries, it is necessary to confirm that certain organizational conditions exist before approving a large investment in information systems which will introduce new knowledge and skills. When these conditions are lacking, perhaps the soundest investment is in their creation (which, admittedly, usually requires new knowledge and skills, but probably of a different order than the original information "need"). Despite a large accumulation of failures of new systems due to the lack of these requisite conditions, these are not usually taken into account. Example: The low efficacy of the majority of the new large-scale information systems observed in the public sector in Central America occurs for rather predictable reasons:

a) the persons to be informed (the users of the information) are not stable in their posts or functions;

b) these persons do not have the authority or power to implement or adapt the new knowledge or skills (that is to say, the information content);

c) these persons do not have the aptitude and terminological or conceptual background to comprehend the new knowledge and skills;

d) the knowledge or skills which are comprehended are redundant for these persons;

e) the organization is already committed to models and technologies other than those which are transmitted or stimulated by the new information system;

f) the implementation or practice of the new knowledge and skills involves excessive opportunity or political costs;

g) the information does not arrive opportunely for the decisions which have to be taken;

h) the capacity does not exist to maintain the new systems or technologies or

i) governmental support for the system's development is not secure during changes of political regime.

9. It is often necessary to "force" the development of user capabilities. We want to facilitate user access to information, but not always do we want the information or even the interface to be "friendly", in the sense of making the user comfortable or happy. Example: In two countries, we demonstrated to top governmental executives that the professionals in their planning ministries have

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little familiarity with basic political and economic documents which they should have read, and some of these professionals (about 10%) even denied that those documents were pertinent for their work. We proposed hard-nosed solutions of routinely circulating documents of this type and obligating their study and discussion by the professionals.

10. At the same time, it is important to recognize the rationality of the users' habits. Example: In a large country where mining is very important, the geologists begin their information search by seeking university theses about the geographical zone of their work. The theses in geology are compilations of the economic, geological, climatic and other information about the zone. A plan was developed to facilitate this user habit.

11. The distinction between information source and information user should be minimized, and the information service should be conceptualized as a power broker among user/sources, since information is power and can enhance authority of those who have or handle it. The transfer or flow of this information is a give-and-take political process (5). Example: In several documentation centres and in development project control systems, we recommended that sources be treated also as users, and vice versa, enhancing both the acquisition of the most useful information and the effectiveness of the services.

12. System maintenance should include a constant study of relationships between the information unit and the user/source. Example: We discovered that the computer operations of several Finance Ministries had fallen into the vicious circles of "poor input leading to poor output, which explains the lack of credibility by the user, which means lack of interest and of quality control at the source (which is also an important user), leading in turn to poor input". In none of these ministries was more than 40% of the computer output likely to be used. Hence, we suggested the adoption of the practice of one Central Bank whereby the Organization and Methods Office annually evaluates the real use made of the computer output and the relationships between the computing centre and the user/source. We also recommended greater quality control at the information source. In one case, we also recommended that the new work controls on keypunchers (in terms of speed and verification errors) be relaxed, since these controls reduced the attention by the keypunchers to coherence in the data received by them.

13. Even in the most apparently "underdeveloped" situations, there is abundant information and almost inevitably there are lots of actual or proposed information systems; they should be exploited before considering new initiatives. In general, reference to existing information and information sources should be carried out before new data systems are designed. Example: a step in the right direction is the development of a centralized reference service to basic studies prepared in or for the Government. In one country, such a service exists and two persons are dedicated full time to visiting the governmental institutions and cataloging the documents. We recommended that they also obtain samples of computer output and statistical tables. Most importantly, the service should be publicized for the purpose indicated here, to evaluate existing information sources as a prelude to designing new systems, and not just as a reference service for students.

14. Reference systems must include document delivery services. Otherwise, they can just lead to frustration. Costly investments should be avoided in printed indexes or abstracts or in data base retrieval,

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unless there are facilities for easy access to the primary documents. Also, the reference system needs to discriminate among users. Thus, in a given sector or discipline, categories of users can be differentiated according to the cost-effectiveness of distinct search and delivery strategies. Example: In medicine, we are suggesting that cost and need be balanced by setting out different information search and delivery strategies, with a decision support focus, for different categories of health problems: epidemics, traditional diseases, new important diseases, occasional or rare diseases, etc., assuring in each case that the practitioners will receive the primary information they need and not just references.

15. Before plunging into costly data bases or control systems, which have been the MIS favorites, it is important to look at the requisite conditions for their effectiveness, and simpler alternatives to them. Among the alternatives are systematic periodic research, action research, strenghthening of informal systems, reference and personalized systems. Example: Public enterprises frequently try to imitate private management in the selection of information systems. They try to implement control systems before determining if the conditions exist for stable performance evaluation criteria and for authoritative decision-by-exception. They try to implement data bases before determining if the conditions exist for an acceptable data or document classification and for structuring an effective user interface or interactive relationship with the data base. In both control sytems and data bases, we have seen that strong incentives have to be given to the data sources to generate quality information regarding the most sensitive objects of the information. A common practice is to protect the interests of the data sources, and thus the possibilities of obtaining the data, by separating out the most sensitive information during processing, but then the user is deprived of the very information of most interest to him or her. When the requisite conditions are lacking (which appears to be the case in most countries in Latin America), research, reference and informal communication are advised, with ever more emphasis on personalized decision-support systems using micro-computers.

16. Especially with regard to acquisition and classification of information for decision-making, the need in developing countries usually is a combination of access to a state-of-the-art or a synthesis of data on the subjects of interest (with possibilities of obtaining more specific data and documents cited in the synthesis) and access to new, challenging and even iconoclastic ideas and perspectives on these subjects. The "Bradford curve" and "topic relevance" mentality (6) which permeates so much information activity, whereby all the emphasis is placed on what is currently most popular among a category of users, leads to the acquisition and classification of information which effectively circumscribes user access to the dominating paradigms, models and data interpretations in the subjects of interest. In many if not most fields, these dominating ideas and perspectives have not resolved or have only contributed marginally to resolve the problems of the developing countries. Instead, they reinforce dependence on inappropriate systems and technologies. An information strategy should orient the acquisition and classification processes so that they permit and facilitate access to pioneer and non-conventional ideas and data analyses, and not only to the dominating ones. Also, there is a special problem with the most popular indexing languages, including those used widely in Latin America: while they are slow to incorporate new descriptors and thus adapt to

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the real information needs of the developing countries, they are already so large that they are difficult to handle in indexing and their retrieval effectiveness is low; nonetheless, their standardization is very useful. Example: We emphasize strongly that specialised governmental and university libraries place a great deal of emphasis on acquisition of internal material, conference proceedings, original research materials, articles from new journals, course handouts and other non-conventional sources, with a strong problem orientation, and that these materials be classified in terms of "problem relevance". We have not had an opportunity to experiment simplified equivalences for thesauri compatibility, as a complement to the addition of terms for "problem relevance".

17. The problem may not be information in many cases, but rather one of communication of the existing information, yet just as there is often bountiful information, there is also large numbers of inefficiently used communication elements. Example: Inventories in certain countries of the translation services, interpreters, agricultural supply salesmen, agricultural and health extension programs, mobile and rural libraries, mass media and other elements of communication of technological information to farmers, show an impressively large communication infrastructure, but with the elements working at cross-purposes and each rather inefficiently serving a small clientele.

18. Communication or documentation networks are best built from the ground up; otherwise those at one (higher) level can weaken those at another (lower) level. A very large proportion of network initiatives fail for this reason. Thus, we recommend strengthening national networks before superimposing international ones, and working on sectorial or subnational zonal networks before building national ones. A strong user/source base has to be built albeit with standardized classifications and procedures, before justifying costly linkages. Once the base is prepared for an initial attempt at linkages, these should be simple at first. For example, they could be arranged around reference activities, whereby the participating information centres simply help each other locate bibliographic references and materials using the tools at hand. This permits immediate payoffs, demonstration effects and the possibility of experimenting network feasibility. Example: We have seen the failure or weakness of regional documentation systems, in such fields as transport, agriculture and management, because the national focal points did not have the authority and prestige to coordinate documentation flows in their respective countries. In fact, the very attempt by an internally weak focal point to gain power and prestige (as well as information) through an international linkage often has led to the isolation and even demise of the former, when the other information sources and centers in the same field in the country do not lend their cooperation or acceptance to the arrangement.

19. The most decisive component of an information strategy, apart from an appropriate determination of the "need" for information, is the planning of human resources. A strategy of personnel retention, training, motivation and awareness is necessary in the developing countries if the organization or project is to avoid dependence on outside consultants and management of the information handling. Training of personnel that can respond to the system specifications set out in this article is very backward in most developing countries. One of the major deficiencies is that the training does not stimulate or prepare the graduate to update himself

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or herself constantly, and the "trained" person adopts a defensive attitude towards his or her domination of the technology, especially with regard to system design strategy. After additional training is carried out, for example on data bases or dynamic specialized reference, the trained person is in high demand and the public sector and universities seldom offer competitive salaries and working conditions. Rather than offer training in sophisticated systems, it is often more practical to use sophisticated approaches to set up simplified data handling. Example: One public organization justified its tailor-made data base design mostly in terms of the linking of personnel training to that unique system, so as to reduce the likelihood that the personnel would leave for higher salaries in the private sector. Training in commercial systems would make the personnel more attractive to others. At the same time, indexing and other data handling were simplified using semi-structured language construction and other techniques, permitting the efficient use of semi-skilled personnel for input preparation (7).

20. An information strategy should assure that local or institutional capabilities and growth are constantly enhanced, rather than depend on outsiders. More and more Latin Americans are aware of the advantages of the transfer of system design and maintenance capabilities rather than turn-key packages. Less recognized is the need to plan for the long-term intellectual growth of the information specialists and workers. Normally, we begin a diagnostic and design activity with the identification of institutional and individual capacities for capability development. One method is to have the target group itself identify and diagnose its own capabilities. We begin this by having the local or institutional analysts or information handlers define or create performance indicators for their own jobs and the problems they have in achieving performance in terms of those indicators. Also, we use reactives intended to determine the aptitude and background of the respondents for creative analytical work. We use the results of this survey, and if possible, of a content analysis of the work of the respondents, in proposing names of counterparts for our work, with the idea that they will be trained to do the diagnostic and design activities under our supervision. In favor of the permanent updating of this personnel, we encourage them to become members of working and study groups of the international information science organizations. Finally, it is important to evaluate and integrate the training, technical cooperation and document support plans and activities for the information analysts and workers.

21. While an information strategy economizes and is realistic for a scarce resource situation, it recognizes that what is seemingly free or inexpensive can actually be very costly. Donated bibliographic materials use up space and processing time which may exceed their value for the local users. Technical assistance is often tied to traditional foci in information work. Cheap rent might mean considerable distances from the users. A donated computer might mean tremendous software problems. A less expensive analyst might mean a lot of costly trial and error.

22. An integrated information science approach to information strategies must deal with strong opposition by professional associations, university faculties and international experts whose prestige and knowledge are based on more specialized and less optimal approaches. We often have found it easier to obtain serious attention to more sophisticated and effective solutions in the more "backward" countries, where the

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narrow information specialities have not been so strongly institutionalized. For example, information science curricula integrating information specialities at the university level or the possibilities of breaking the conventional but inconvenient career sequence of programming and systems' analysis appear to be more easily accepted in the lesser developed countries.

23. Apart from the problem of relevant information for decision-making, the other key general problem to be addressed in an information strategy is the systematic capturing, processing, storage and "retrievability" of the most important information being produced in and for the governments or universities. Most of this information (mostly "unconventional") disappears immediately, sometimes by negligence, sometimes (as in cases of the nationalization of enterprises or infrastructure) instigated by outsiders. The information-drain is as serious as the brain-drain. We call attention to a great variety of acquisition methods and new records management methods so that the countries have a copy for future retrieval of their intellectual documents and working records. Example: One most effective and economical approach is a decentralized legal deposits system adopted by one country, taking advantage of close relationships between each deposit centre and groups of information producers. Under governmental auspices, there are separate systems for obtaining governmental documents and for obtaining publications from authors, film-makers, recording studios and private editors and printing houses. There are separate deposit centres for different kinds of materials, such as films, recordings, cartographic materials, etc., delegating this function to institutions which have adequate storage and access facilities. This is more economical than the "National Library or Archives" approach, and leads to a better rate of recovery of the materials.

24. A really viable and relevant information strategy must be sensitive to national economic, security and socio-cultural interests and the configuration of the local political interests of the country involved. All information-gathering and processing add or weaken potential authority and political power for or against the interests of the country and of determined groups. Example: The creation of a simple origen-destination traffic data system, whereby licensed truckers were to leave a form at police posts along the road, led to some of the licensed truckers selling their trucks and (as "comisionistas") making much greater profits with less effort by reselling the forms to non-licensed operators, including the contraband and pirate operators. Some "comisionistas" sold trucks to foreign transporters, the former obtaining the forms for the latter, and thus reducing the added value to the country on transport movements of its trade. In order to protect their monopoly over the truck movements which could pass the police posts, the licensed "comisionistas" rapidly became a powerful interest group against compliance by the country with its commitments to neighbouring countries regarding international truck movements and against an attempt to make real sense of the licensing of trucks in the country.

The application of these twenty-four design principles requires considerable awareness of current information science concepts and techniques. Among the concepts which can help make the difference (with the cautionary note that we have taken issue here explicitly and implicitly with some of the ways these concepts are applied) are inform ion quality control, topic and problem relevance, expert systems, user-friendly interface, distributed data systems, community or organizational communication systems, informal networks, ques-

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tion negotiation, dynamic reference, document delivery, Bradford's Law, SDI, personalized systems, functional ignorance and information science itself.
A major problem for relevant and effective information strategies is the wide popularization of distorted and narrow systems' approaches, as when information is presumed to be an end in itself (as when it is the major "input", "output" and "feedback" of the "system"), and information quantity becomes the priority concern (as when computer use is more important than computer utility) (8). The popularized sector- or discipline-oriented systems' approach becomes the worst enemy to systems' thinking (9). Instead, the analyst should engage in "purposefully designing paradox", for example, by integrating the systems' approach with politics (and political viability) and with values of "goodness" (morality, religion, aesthetics) or combining social interaction with intellectual cognition (10).

In the action-research methodology we use, the emphasis is on the consideration and change of the values, perception and opinion of those who use and handle information. A reconstruction is made of their own definitions and projects of their work and information problems. Using the Delphi Method, this reconstruction is then contrasted with the normative systems' models which the analyst proposes. These normative models take into account the principles set out in this article (11).

Given the common distortion and misuse of systems' concepts, we have preferred to promote information strategies, considering information systems to be strategy options rather than the major foci of information work. The strategy can be medium-term, for organizing information centres and flows which respond to the needs for production, control and questioning in the institution or project. It can be short-term, proposing activities to exploit existing information and to fill in information gaps with new systems or research, in order to assure that the program and projects needs are met.

(1) The Institute's methodology is presented in an instructional package. The main documents of this package include: Warren Crowther and Flor Cubero, Apuntes para el Elaboracion de Estrategias de Informacion para las Instituciones del Sector Publico. San José, Costa Rica. ICAP, 1983; Xinia Picado and Warren Crowther, El Control en el Sector Publico: Administracion, es mas que Control, Control es mas que Informacion e Informacion es mas que Datos. San José, Costa Rica. ICAP, 1985; Warren Crowther, Diagnostico y Diseno de Sistemas de Informacion para la Administracion Publica: Cuadros de Trabajo. San José, Costa Rica. ICAP, 1982. That many, if not most, of the principles are pertinent also in more industralized countries is evident, for example, in N.J. Belkin, T. Seeger and G. Wersig, "Distributed expert problem treatment as a model for information system analysis and design", Journal of Information Science, 5, 1983, 153-167.

(2) A "client" is a project, institution or sector interested in an information strategy for its work or working environment. A "user" is a person or institution which receives information. The client and the user often are the same person, and often are different. In the latter case, the analyst must satisfy the client's specifications and inform or facilitate interface for the user accordingly. For example, a client can be the Agricultural Ministry and the users can be the farmers.

(3) A negative impact occurs, for example, when the students limit themselves to using the most proximate centre's small collection as their entire bibliographic resource, despite larger relevant holdings in other centres on the campus. This was common in some faculties.

(4) The Delphi Method involves a dialogue between the analyst and a group of respondents, whereby the

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respondents give individual replies to the reactives or stimuli emitted by the analyst, and the analyst feeds back a synthesis of those replies collectively to the group of respondents, who in turn can respond individually to the synthesis. The dialogue may continue in this form.

(5) Thus we do not agree with the commn contention that information is necessarily unlike other economic commodities in that the supplier (or seller) keeps what he gives (or sells) to the receiver (or buyer). The first hoards or shares the power and the authority that are a great part of the value of the information to him. Usually the power or authority diminishes for the person who has it originally, when the information is shared, unless the information is traded for other symbols of power and authority (which may be other information).

(6) While the Bradford Curve is useful in evaluating the use of materials in a collection, acquisition should not be limited to the most used materials in a field. This is recognized by Herbert White, Managing the Special Library, White Plains, Knowledge Industry, 1984, Chapter 5. On "topic relevance", see Florence DeHart "Topic Relevance and Retrieval Effectiveness", International Classification, 10 (1), 1983, 9-14.

(7) A semi-structured (or semi-faceted or double level) language is one which is in part highly structured around several variables or "facets", and the indexer must select one or more terms or descriptors for each variable or "facet" when indexing each document or data set. In addition, there is a free vocabulary option for expansion of the content description beyond the "facets". An example of this is the indexing sheet of the AGRINTER system of the Instituto Interamericano de Ciencias Agricolas. Wilfred Lancaster has mentioned that the Central Intelligence Agency of the United States also uses the double level language. Ideally, the user information request form would also be structured around the "facets", assuring a high degree of retrieval efficiency.

(8) Perhaps there is an inherent contradiction in the term "information system". If such a system means that we are concerned about its homeostasis or entrophy, and thus its survival or maintenance as such, an "information system" or a "library system" is indefensible. What should be of concern is the support of the information and information centres to a larger "system" which is the society. (In the case of the public sector or university, I would even question if we should talk about "organizational systems"). This is not to say, of course, that systematic concepts are not needed in the elaboration of an information strategy with its "information subsystems".

(9) This is my own conclusion, based on such critiques as:
C. West Churchman, The Systems Approach and Its Enemies. New York, Basic Books, 1979; Aaron Wildavsky, Speaking Truth to Power: The Art and Craft of Policy-Analysis. Boston, Little, Brown and Company, 1979; John Gall, Systematics: How Systems Work and Especially How They Fail. New York, Pocket Books, 1975.

(10) Churchman, op. cit., 204; Wildavsky, op. cit., 12.

(11) We have experimented the use of 45 instruments and techniques for obtaining and processing this information in a very agile form, in order to have a good idea of information requirements and change conditions and contingencies in public and educational institutions. Regarding the Delphi Method, see note (4) above.